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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,144	12/17/2004	Teruhiro Shiono	10873.1549USWO	7935
53148 7590 04/01/2009 HAMRE, SCHUMANN, MUELLER & LARSON P.C. P.O. BOX 2902-0902 MINNEAPOLIS, MN 55402				
EXAMINER VERDERAME, ANNA L.				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
04/01/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,144

Applicant(s)

SHIONO ET AL.

Examiner

ANNA L. VERDERAME

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 16-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
- Paper No(s)/Mail Date 2/18/2009
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

The response filed on 02/18/2009 has been carefully considered. A response is presented below.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, and 4-9 rejected under 35 U.S.C. 102(b) as being anticipated by Berman et al. US 3,899,333.

Berman et al. teaches a data storage medium comprising a substrate having a radiation sensitive coating consisting essentially of particulate titanium dioxide dispersed in a binder and developable after exposure. The average size of the titanium dioxide particles is about 25 nm(abstract). The substrate is a glass or resin substrate(3/1-7). Binders are disclosed at (2/39-50). The ratio of TiO₂ to binder in the coating may vary between 8:1 to 1:4(2/50-55). Coatings having a thickness of less than 10 mm are preferred(2/62).

In example 1 a coating comprising 25 nm TiO₂ particles in a resin binder was formed. the weight ratio of TiO₂ particles to binder particles was 4 to 1(3/63-

4/20). The medium was exposed to light having a wavelength of 420 nm and was developed(4/49-54).

3. Claims 1 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Ichihara et al. US 5,889,756.

In example 1 Ichihara et al. teaches an optical recording medium comprising a substrate, a ZnS-SiO₂ layer, a recording layer comprising GeSbTe particles dispersed in a TiO₂ matrix(refractive index 2.2), a ZnS-SiO₂ layer and a reflective layer. GeSbTe content is 71 vol%(7/50-8/26).

In this example ZnS-SiO₂ is the protective layer recited in instant claim 12.

The recording film containing GeSbTe particles in a TiO₂ matrix corresponds to the titanium-oxide containing recording layer of claim 1.

4. Claims 1-9 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Ozaki et al. EP 0 924 094.

Ozaki et al. teaches a resin-coated support favorably employable as a support of an image recording material formed by mixing and kneading a polyolefin resin with titanium dioxide(abstract). Materials for the support layer are disclosed at (0014) and include those made of synthetic resin films and thermoplastic resin films. The titanium dioxide particles dispersed in the film have a mean particle size of 0.1 to 0.4 micrometers/100-400 nm (0024). The content of titanium dioxide in the film is in the range of 30% to 75% by weight(0028)

In example 1 a film having 15% by weight of anatase-type titanium dioxide having a mean particle size of 0.16 micrometers is formed(0037-0038).

Examples of films containing 15-30 parts by weight of TiO_2 are taught in table 1 (0056).

In this example a wavelength of 640nm or greater could be used for recording in order to meet the limitation of claim 8. Recitation of recording wavelength by reciting particle size in terms of the recording wavelength is considered intended use.

5. Claims 1-2, 4, 12, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by anticipated by Furuya et al. WO 00/13178(US 6,759,137 used as an English language translation).

Teaches an example wherein a rutile TiO_2 layer having a thickness of 100 nm was formed on a glass substrate. The particles size of the rutile layer was in the range of from 2 nm to 30 nm[(WO pages 10-11)/(US9/25-10/12)]. further teaches formation of a transparent layer on the recording layer[(WO page 9)/(US8/60-63)]. Wavelengths of 700nm or less were used for recording.

Applicant's recites particle size and recording layer thickness in terms of the wavelength of recording light and reproducing light. This is considered intended use.

In this example the transparent layer corresponds to applicant's protective layer.

6. Claims 1-8 , and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Na et al. US 6,576,589.

Na et al. teaches two examples (examples 2 and 3) in which an anatase-type TiO_2 - SiO_2 layer (67:33 in mol% ratio and 50:50 in mol% ratio respectively) is formed on a glass substrate. Particles size of TiO_2 was found to be 15 nm(5/50) and 12.2 nm(6/24). The film was subjected to a laser having a wavelength of about 250 nm(5/20-6/32).

In this example SiO_2 is the low refractive index inorganic material.

Example 3 in which the TiO_2 - SiO_2 is 67:33 meets the limitation of claim 4.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozaki et al. EP 0 924 094 as applied above in view of Alperovich et al. US 2002/0098446.

Ozaki et al. teaches an information recording layer containing TiO_2 particles dispersed in a polyolefin resin binder. The reference does not disclose a multi-layer optical recording medium as recited in instant claims 13-14.

Alperovich et al. teaches a multilayer optical recording medium comprising a substrate 101 on which an active layer 112 comprising a fluorescent phase in a thermoplastic polymer, and a quenching phase 103 as a thermoplastic polymer containing a quencher(0045). To obtain a multi-layer disc one layer discs are

glued together in such a way that active layers would alternate with non-active spacing layers on a substrate(0046). The examiner takes the disclosure that the spacing layers are non-active to indicate that they contain neither fluorescent compounds nor quenchers, but contain only polymer. Polymers used for the fluorescence and quenching phases include polyolefins(0076).

Alperovich essentially teaches a multi-layer medium comprising active layers wherein an active compound is dispersed in a polymer matrix and spacing layers containing only polymer. The spacing layers allow for separation of the recording layers and must be transparent in order for recording light to reach further recording layers.

It would have been obvious to one of ordinary skill in the art to modify the single layer medium taught by Ozaki et al. comprising TiO₂ particles dispersed in a polyolefin resin matrix by forming a polyolefin spacer layer on the recording layer and laminating a second recording layer comprising TiO₂ particles dispersed in a polyolefin resin matrix thereon with the reasonable expectation of forming a medium having increased recording capacity. A multi-layer medium like that formed by Alperovich can be formed in this manner. Using the same polymer material for the matrix material and for the spacing layers is more economical because you can purchase that material in bulk(usually at a lower price) rather than having to buy smaller quantities of two different materials.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-9 and 11-15 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 7,313,080 in view of Ozaki et al. EP 0 924 094. The claims in patent 7,313,080 teach a multi-layer medium comprised of intermediate layer and recording layer wherein the recording layers contain particles dispersed in a particle-holding material. In an example ZnO particles having an average size of 30 nm are dispersed in a UV curing resin. The recording layer having a thickness of 0.13-1 micrometer and a laser having a wavelength of 740 nm is used for recording(16/35-67). This shows that the limitations recited in instant claims 8 and 15 are embraced by the claims of patent 7,313,080. **Use of TiO₂ particles is recited in claim 16 of patent 7,313,080. One would immediately envision an embodiment wherein TiO₂ particles were used instead of ZnO particles based on disclosure in claim 16 of patent 7,313,080.** The claims of patent

7,313,080 do not teach the limitation that the titanium dioxide particles are at least one type selected from anatase type, brookite type and rutile type.

Ozaki et al. teaches a layer for use in a recording medium comprising anatase type TiO_2 particles in a resin binder.

It would have been obvious to use an anatase type TiO_2 particles based on the example of Ozaki et al. and with the reasonable expectation of success.

Response to Arguments

11. Applicant's arguments filed 12/24/2008 have been fully considered but they are not persuasive.

Berman- The applicant argues that Berman does not disclose or suggest a recording portion capable of storing information three-dimensionally by irradiation with light. This is incorrect. Berman discloses recording by irradiation with light. The bits will be three dimensional if the layer has any sort of thickness. Berman's example is like applicant's embodiment 2, described on pages 21-25 of the applicant's specification, where TiO_2 particles are dispersed in a low-refractive index material which can be a resin. Therefore it is the position of the examiner that, since the embodiment of Berman is identical to applicant's embodiment 2, the information will inherently be recorded by a change in configuration of TiO_2 . The rejection stands.

The examiner notes that the applicant has pointed to disclosure pertaining to embodiment 1 to support the amendment of claim 1. In embodiment 1 the recording layer is 90% or more TiO_2 . If only this embodiment and not embodiment 2 involve

recording of information by a change in configuration of TiO_2 then applicant should delete claims 5-10, and 13-14 which pertain to embodiments like embodiment 2 where TiO_2 particles are dispersed in a binder and the amount of TiO_2 can be in the range of 5 wt% to less than 100 wt %.

Ichihara: Claim 1 requires a recording layer containing TiO_2 . The fact that the information is recorded using laser light or that the information is recorded by a change in configuration in titanium oxide is intended use. The claim reads on the unrecorded medium having a recording layer that contains titanium oxide. Ichihara et al. discloses recording with light and teaches the transparent protective layer of claim 12. Ichihara discloses recording by irradiation with light. The bits will be three dimensional if the layer has any sort of thickness. The rejection stands.

The examiner notes that the applicant has pointed to disclosure pertaining to embodiment 1 to support the amendment of claim 1. In embodiment 1 the recording layer is 90% or more TiO_2 . If only this embodiment and not embodiment 2 involve recording of information by a change in configuration of TiO_2 then applicant should delete claims 5-10, and 13-14 which pertain to embodiments like embodiment 2 where TiO_2 particles are dispersed in a binder and the amount of TiO_2 can be in the range of 5 wt% to less than 100 wt %.

Ozaki : Claim 1 requires a recording layer containing TiO_2 . The fact that the information is recorded using laser light or that the information is recorded by a change in

configuration in titanium oxide is intended use. The claims read on the unrecorded medium having a recording layer that contains titanium oxide.

Furuya: The example in Furuya et al. is like applicant's embodiment 1 where the recording layer contains 90% or more TiO_2 . The medium is disclosed as being recorded using a wavelength of 700 nm or less. The bits formed during recording will be three dimensional if the layer has any sort of thickness. Because the example of Furuya et al. is like applicant's embodiment 1, the information will inherently be recorded by a change in configuration of titanium oxide which occurs upon exposure. The rejection stands.

Na: The applicant argues that Na does not disclose or suggest a recording portion capable of storing information three-dimensionally by irradiation with light. This is incorrect. Na discloses recording by irradiation with light. The bits will be three dimensional if the layer has any sort of thickness. Na's example is like applicant's embodiment 2, described on pages 21-25 of the applicant's specification, where TiO_2 particles are dispersed in a low-refractive index material which such as SiO_2 . See page 24 of the applicant's specification. Therefore it is the position of the examiner that, since the embodiment of Na is identical to applicant's embodiment 2, the information will inherently be recorded by a change in configuration of TiO_2 . In paragraph 2 on page 24 it is stated that information is formed by "deformation of the low refractive index material in combination with the change in configuration of titanium oxide". The rejection stands.

Double Patenting over Shino in view of Ozaki: A medium wherein TiO_2 particles are dispersed in a resin binder is exemplified in applicant's embodiment 2 and is obvious in view of the claims of Shino for the reasons provided above. Because these embodiments are identical, it is the position of the examiner that recording proceeds in each embodiment via a change in configuration of titanium dioxide. Absorption of heat by titanium oxide is disclosed as resulting in a change in configuration of titanium oxide in paragraph 1 on page 24 of the applicant's specification. Ozaki is used for disclosure to use anatase type TiO_2 in an image recording layer having TiO_2 particles dispersed in a binder.

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANNA L. VERDERAME whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795

/Anna L Verderame/
Examiner, Art Unit 1795